Reliability in the toughest environment

The XE-800 SBC is a high-performance single board computer (SBC) with a rich family of essential I/O functions. It integrates video, serial ports, Ethernet, digital I/O, and USB networking into a single card. With a Pentium II®-compatible CPU, Ethernet, and six USB ports it is ideal as a USB hub for command, control, and communications. The XE-800 SBC is the solution for applications in transportation, security, military, communications, distributed control, point-of-sale, ticketing machines, weighing equipment, and other similar applications. The low-power requirements make it suitable for situations where battery life or heat dissipation is a concern.

The CPU provides enough computing power for virtually any embedded applications. It is fully compatible with most operating systems, and Octagon Systems has developed OS Embedder™ kits with all the necessary drivers to get you quickly up and running with your required operating system. The built-in INT17 functions for DOS provide easy access to the enhanced features such as watchdog timer, read/writes to serial EEPROM, and user jumper.

Our products are designed and manufactured with exacting specifications under the supervision of a Quality Management System that is ISO 9001-2000 certified. The XE-800 will withstand high shock and vibration, and operates in temperature ranges from -40° to +80° C. This rugged single board computer will provide years of reliable service in the most challenging environments.

OS Embedder kits available

Reduce the cost of development. Be first to market. The XE-800 SBC is fully compatible with Windows CE.net, Linux, QNX, and DOS. Octagon has developed OS Embedder kits with all the necessary drivers to get you quickly up and running with your required operating system. We are your single hardware and software source with free technical support.

Kits provide everything you need for fast, easy implementation of the operating system of your choice.

- ◆ XE-800 CPU
- ◆ Cables
- ◆ Drivers
- ◆ Sample programs
- ◆ Documentation
- ◆ Unlimited technical support

Features

SYSTEM:

◆ AMD Geode GX1 CPU with CS5530A companion chip

◆ 300 MHz clock speed

◆ PC-compatible DMA controllers, interrupt controllers, and timers

◆ Fully compatible with Windows CE.net, Linux, QNX, and DOS

◆ Phoenix BIOS with fast boot and industrial extensions

◆ SO-DIMM socket for up to 512 MB SDRAM

◆ 1024 words available in serial EEPROM for user

◆ Watchdog timer with 2 milliseconds to 128 seconds timeout, software controlled.

DRIVES:

◆ Standard EIDE interface supports two devices (CD-ROM, hard drive, EIDE flash drives, other EIDE devices)

◆ CompactFlash on primary IDE controller, accepts Type I or Type II devices, for third EIDE device.

I/O:

◆ PS/2 mouse and keyboard

◆ On-board video controller for CRT or TFT flat panels

◆ Dedicated digital I/O, 48 lines

◆ Two eight-wire serial ports; 16C550 compatible, RS-232/422/485, 16-byte FIFO buffered, ESD protected

◆ Six USB ports; four 2.0 compliant; two 1.1 compliant

◆ PC/104, 16-bit ISA Bus; PC/104 Plus 32-bit PCI Bus

◆ Ethernet 10/100 Base-T, IEEE 802.3 standard

USER INTERFACE:

◆ 18-bit TFT flat panel with resolutions to 1024 x 768; or CRT, with resolutions to 1280 x 1024

◆ PS/2 keyboard and mouse

◆ Serial console through COM1 to host computer

MOUNTING:

◆ Panel mounted with standoffs

◆ Accepts PC/104 and PC/104 Plus cards

OTHER:

◆ AT battery port for real time clock (no battery necessary for operation)

◆ Size 115 mm x 165 mm x 20 mm (4.53" x 6.50" x 0.80"); **EPIC*** form factor

◆ Power 5V ±0.25V @ 1.5A typical (64 MB SDRAM)

◆ –40° to 80° C operating range, w/ventilation

◆ –40° to 70° C operating range, w/o ventilation

HW ORDERING INFORMATION

Call 303-430-1500 for assistance.

OS EMBEDDER ORDERING INFORMATION

Call 303-430-1500 for assistance.

*Embedded Platform for Industrial Computers™

Technical Descriptions

Busses
PCI Bus: 33 MHz, 32-bit, rev. 2.1 specification
Video Bus: 50 MHz to 135 MHz
ISA Bus: 8.33 MHz

System
CPU: The CPU is an AMD Geode GX1. It is a high-performance, low-power microprocessor with a clock speed of 300 MHz. The GX1 contains the complete x86 core, along with a host of PCI Bus functions, typically implemented with external components. The GX1 is 100 percent object-code compatible with the Intel x86 microprocessors, as well as the MMX instruction set extensions for the acceleration of multimedia applications.

CS5530A companion chip: The CS5530A implements the video, two USB, two IDE controllers, and PCI-to-ISA bridge, as well as a host of internal functions such as interrupt controllers, timer, DMA controller, and GPIO manager. Through the ISA bus the CS5530A accesses the boot flash, PC/104 expansion slot, and bit programmable.

Super I/O: The 87377 super I/O controls the two 16C550 COM ports, RTC, keyboard, mouse interfaces.

Operating system: The XE-800 SBC is fully compatible with Windows CE.net, Linux, QNX, and DOS.

BIOS: The XE-800 SBC has a Phoenix AT BIOS. The BIOS is fully PC-AT compatible. It supports two IDE hard drives, along with keyboard, mouse, and other PC peripherals. The BIOS also has additional Octagon BIOS extensions for watchdog timer, and user jumper.

At power-on the BIOS performs a Power-On-Self-Test (POST) and reports the results via an LED. Refer to the XE-800 SBC User's Manual for an interpretation of the codes.

SDRAM: The memory socket can accept up to 512 MB capacity SO-DIMM modules.

Watchdog timer: The watchdog timer is a fail-safe against program crashes or processor lockups. It has a programmable timeout period, ranging from 2.0 milliseconds to 120 seconds. The watchdog is enabled in BIOS SETUP and then automatically initiated on power-up. Drivers calls are used to set the timeout period, strobe, and disable the watchdog timer from your application. If the timer expires, it performs a hardware reset.

Drives
EIDE: The XE-800 SBC supports a CompactFlash on the primary IDE channel. For the secondary channel there is an industry-standard 44-pin, 2 mm connector for EIDE devices such as hard drives, EIDE flash drives or CR-ROMs. For those hard drives that use a 40-pin connector Octagon has a 44-pin to 40-pin adapter cable. An EIDE cable connects to the XE-800 connector and provides two connectors for the devices. The individual devices have a jumper to designate them as a master or a slave device. The IDE channels are ATA-4 compliant.

CompactFlash: The CompactFlash socket accepts type I or type II devices. CompactFlash is connected to the primary IDE channel and appears as an IDE device.

I/O
Keyboard/mouse: The CS5530A supports a PS/2 keyboard and mouse. Neither a keyboard nor a mouse is required for operation.

USB: Four 2.0-compliant USB ports are supported by a Phillips ISP1561 controller. The 2.0 ports have over-current and ESD protection. Two additional 1.1 compliant USB ports are supported by the CS5530A companion chip. 1.1 provides transmission up to 12 Mbps, while 2.0 extends the throughput to 480 Mbps.

Ethernet: An Intel 82551ER (82559 compatible) chip provides one 10/100 Base-T Ethernet port and supports the IEEE 802.3 Ethernet standard. The Ethernet controller IC chip provides an 8k x 16 SRAM buffer, and powers two LEDs for link and traffic status. The interface terminates at the standard 8-position, RJ-45 phone jack.

PC/104 and PC/104 Plus interfaces: PC/104 is a 16-bit interface on the 8.33 MHz ISA Bus; PC/104 Plus is a 32-bit interface on the 33 MHz PCI Bus. Up to four cards can be stacked on these connectors. If +3 or +12V power is required for an expansion card, you can provide it through the power connector on the XE-800 SBC.

Digital I/O: There are 48 lines of bit-programmable digital I/O. These lines will interface with logic devices, switch inputs, LEDs, and industry-standard opto module racks. All lines can be individually programmed as inputs or outputs. Octagon has a variety of opto modules and termination boards for easy access for field wiring.

COM1 and COM2: Two 16C550-compatible serial channels are provided. Each channel is an eight-wire, full duplex, asynchronous RS-232C interface with a double 16-bit FIFO buffer. The baud rate is programmable with rates from 9600 bps to 115.2 kbps. The ports provide backdrive protection as well as ESD protection according to IEC 1000, level 3; contact discharge of ±6 kV, and air-gap discharge of ±8 kV.

COM2 can be configured in BIOS Setup as a 4-wire, RS-422 or RS-485 interface. RS-422 and RS-485 use differential signaling to communicate between devices. Differential signaling reduces the effects of environmental noise, allowing communication over distances up to 1,200 meters.

The RS-232C COM ports terminate in a 20-pin cable; RS-422/485 terminate in a separate 5-pin connector. Octagon Systems has cables to route these connectors to industry-standard interfaces.

User Interface
Monitors: The CS5530A chip supports CRTs with resolutions to 1280 x 1024, and 18-bit TFT flat panels with resolutions up to 1024 x 768.

Serial console: You can establish communication with the XE-800 SBC using a host computer as a serial console. COM1 of the XE-800 SBC is connected to a COM port on the host PC. A program such as SmartLINK or Hyperterminal on the host PC directly communicates to the XE-800 SBC. This allows you to download programs or configure the XE-800 SBC.

Custom cables
The following cables connect to the XE-800 SBC and provide industry-standard interfaces:

COM PORT VTC-20F cable: Connects to the 20-pin COM1/2 port and provides two DB-9 female connectors. A VTC-20M provides two DB-9 male connectors.

XE800 COM2 RS-422/485 cable: Connects to the 5-pin header and provides a standard DB-9 interface for RS-422/485.

2 mm VGA-12 cable: Provides a standard 15-pin VGA interface.

44-pin to 40-pin IDE cable: Converts the 44-pin IDE header to a 40-pin IDE header.

Two-port USB cable: Converts the 10-pin header for USB1,2 into two standard 1.1 USB interfaces.

Mounting
Panel mounting: You can panel mount the XE-800 using eight #4-40 standoff and screws (not provided). The XE-800 SBC User's Manual shows the center-to-center mounting hole dimensions.

Functional diagram

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                SDRAM                              CRT    Flat panel

                                                                              USB 1,2 (1.1)

              CPU                                  CS5530                     PS/2 Kybd, mouse
                                                  companion
                                                    chip                      CompactFlash
                                                                               IDE drives

           Ethernet              Boot flash

                                                         87377                 COM 1,2
        PC/104 Plus              PC/104                 Super I/O
         expansion              expansion                                        COM 2
                                                                                422/485

        USB 3,4,5,6                                     EZ I/O
          (2.0)                                       Digital I/O
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